

[002] This application claims priority from German Application Serial  
No. 103 55 393.9 filed November 28, 2002.

[003] FIELD OF THE INVENTION

[004] The invention concerns an auxiliary transmission with controllable clutch; of the type defined in more detail in the preamble of claim 1.

[005] BACKGROUND OF THE INVENTION

[006] From {{US}} U.S. Patent No. 5,409,429 an auxiliary transmission is known, by virtue of which all-wheel drive can be engaged in case of need. For this, the auxiliary transmission has a controllable clutch and a distributor unit for the optional distribution of the drive torque to one or two drive output shafts of a vehicle. In addition, the auxiliary transmission is made with a reduction gear stage and a hydraulic pump.

[009] —— According to the invention this objective is achieved with an auxiliary transmission having the characteristics of claim 1.

[010] SUMMARY OF THE INVENTION

[016] BRIEF DESCRIPTION OF THE DRAWINGS

[017] —— Other advantages and advantageous design features of the object of the invention emerge from the description, the drawing and the claims. The drawing shows: The invention will now be described, by way of example, with reference to the accompanying drawings in which:

[020] DETAILED DESCRIPTION OF THE INVENTION

- [024] The shaft 33 is displaced by a spherical-thread drive in the axial direction of the auxiliary transmission 31, whereby the sliding bush 32 can be moved between two engagement positions. In a first engagement position of the sliding bush 32 an annular gear wheel 9 of the planetary gear wheel assembly 3 is connected to a web 10 of the planetary gear wheel assembly. In the second engagement position of the sliding bush 32, the annular gear wheel 9 is connected fast to a transmission housing of the auxiliary transmission [[1]] 31 not shown in detail. The off-road gear of the auxiliary transmission 31 is engaged when the annular gear wheel 9 is connected fast to the transmission housing of the auxiliary transmission 31 by virtue of claw teeth of the sliding bush 32. When the annular gear wheel 9 is connected rotationally fast to the web or planetary gear support 10 of the planetary gear wheel assembly 3 by the claw teeth of the sliding bush 32, the off-road gear of the auxiliary transmission [[1]] 31 is deactivated.
- [026] At the end of the auxiliary transmission [[1]] 31 facing away from the planetary gear wheel assembly 3 a hydraulic pump 14 is arranged directly on the drive input shaft 4, which is provided in order to supply the auxiliary transmission [[1]] 31 with oil and which is driven at the speed of the drive input shaft 4. The arrangement of this hydraulic pump 14 ensures that even when the off-road gear is engaged the delivery performance of the hydraulic pump 14 remains constant, since the drive input speed to the hydraulic pump 14 remains constant notwithstanding the change in transmission ratio when the off-road gear is engaged.
- [031] The electric motor 8 is arranged in the coupling zone 18 between the auxiliary transmission [[1]] 31 and the main transmission unit 17 in such manner that it projects beyond an area of the main transmission unit 17 facing towards the auxiliary transmission [[1]] 31 and is positioned outside a housing 19 of the main transmission unit. This allows the housing 19 of the main transmission unit 17 to be designed independently of the electric motor 8 and simplifies the assembly of the range-change transmission 1 as a whole.

[037] To be able to reduce the distance between the auxiliary transmission [[1]] 31 and the main transmission unit 17 in the coupling zone 18, in the embodiment of the auxiliary transmission 31 shown in Fig. 2 the universal joint 24 arranged on the end of the cardan shaft 23 facing towards the second drive output shaft 6 is integrated in the first gear wheel 20. This increases the distance between the two link points of the two universal joints of the cardan shaft 23, so that the deflection angle of the cardan shaft is reduced. This measure allows larger offsets to be accommodated between the auxiliary transmission 31 or its second drive output shaft 6 and the drive shaft of the drive wheels, than with the embodiment of the auxiliary transmission 31 shown in Fig. 1.